

NASA's Return On Investment Report

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This bi-monthly newsletter of accomplishments, progress, and happenings in NASA's commercial crew and cargo programs is distributed by the Commercial Spaceflight Development Division at NASA Headquarters. For additional information, check out: <http://www.nasa.gov/exploration/commercial/>

NASA INITIATES "CCiCAP" COMPETITION FOR NEXT ROUND OF COMMERCIAL CREW DEVELOPMENT

NASA released an announcement inviting industry to submit proposals for Commercial Crew Integrated Capability (CCiCap) work on Feb. 7. Like Commercial Crew Development (CCDev) rounds 1 and 2, CCiCap will use competitive, funded Space Act Agreements (SAAs) to foster development of the next U.S. spacecraft and launch systems to carry humans to low Earth orbit and the International Space Station (ISS). Proposals are due March 23, and NASA anticipates making multiple awards by July or August.

The announcement asks industry to propose a "base period" of approximately 21 months, running from SAA award through May of 2014. Each base period proposal should include completing the design of a fully integrated commercial crew transportation system,

consisting of the spacecraft, launch vehicle, ground operations and mission control. NASA also expects the base period proposals to include major test events such as uncrewed flight tests, pad abort tests, and drop tests. In addition, NASA is asking for proposals to contain optional milestones to be accomplished after the base period to culminate in a crewed demonstration flight by the mid-part of the decade.

"Under the previous Commercial Crew Development solicitations, industry partners gave us glimpses into their longer range plans. Under CCiCap, we are expecting industry to propose carefully developed plans that include optional milestones all the way to an orbital demonstration with humans on board," says Brent Jett, Deputy Manager of the Commercial Crew Program.

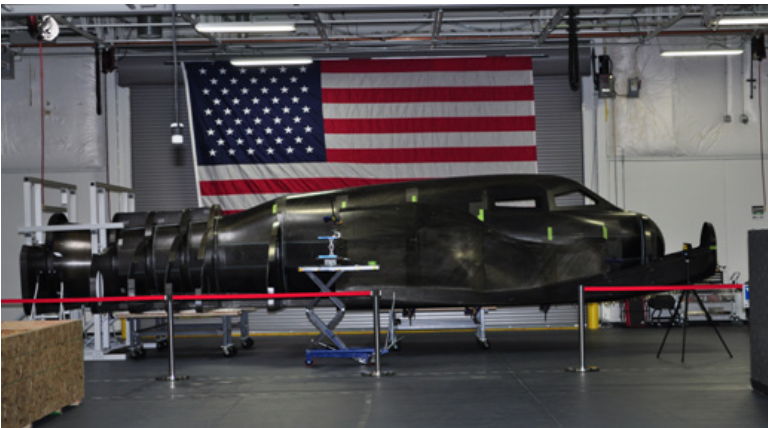
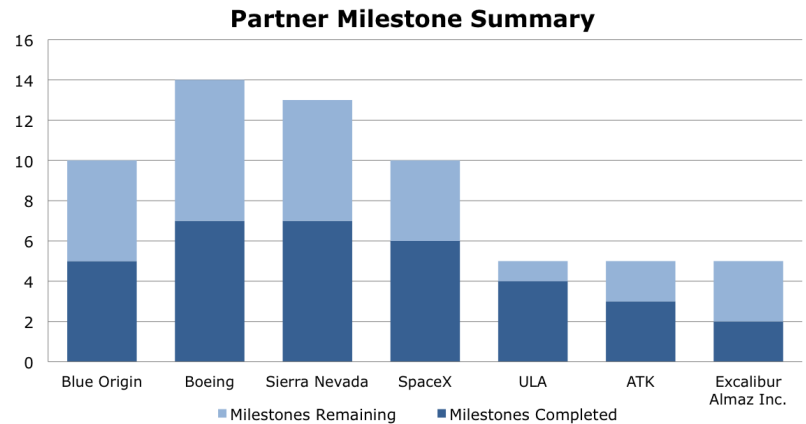


NASA discusses the CCiCap announcement with industry representatives on February 14 in Cocoa Beach, Florida.

SAA's are again being used for this next phase because they provide significant flexibility for both NASA and industry, a feature which is critical in the current uncertain budget environment. They also facilitate combining NASA investments with industry private funding resulting in more money being available for the development of commercial crew transportation systems. These systems will ultimately be available to the U.S. Government and other commercial customers.

INDUSTRY PARTNERS COMPLETE EIGHT MORE SAA MILESTONES

NASA's industry partners continue to make good progress in maturing designs and development of their commercial crew transportation systems under CCDev2. During the past two months, eight milestones were completed by Sierra Nevada, SpaceX, Boeing, United Launch Alliance, Alliant Techsystems, Inc., and Excalibur Almaz, Inc. This brings the total number of completed milestones under CCDev2 to 34 of the 62 planned. Each of these milestone accomplishments brings the United States one step closer to ending the gap in America's human access to space.



Dream Chaser ETA. Photo courtesy Sierra Nevada.

Among the recent milestones was Sierra Nevada's delivery of their Dream Chaser spacecraft Engineering Test Article (ETA) structure at their facility in Louisville, Colorado. The all-composite structure was designed by the Sierra Nevada team and built in collaboration with composite industry experts. When completed, the Dream Chaser ETA will be a full-scale prototype of the company's planned orbital spacecraft. It will be used for several tests, including a free-flight test of the vehicle in the summer. These upcoming test milestones are critical to further understanding aerodynamic and control qualities to validate computer models used to finalize the design of the Dream Chaser.



Rex Walheim and other NASA astronauts evaluate SpaceX's Dragon crew cabin prototype. Photo courtesy SpaceX.

Another recent milestone was SpaceX's "Crew Accommodation Concept Prototype and In-Situ 1" milestone. For this event, SpaceX completed prototypes of the Dragon spacecraft's crew cabin, seats, and control panel layout. NASA astronauts participated in trial evaluations of the crew cabin and provided feedback to SpaceX. The data will be used to refine their prototype designs to improve usability, reduce the chance of human error, and improve functionality in preparation for a second astronaut evaluation trial scheduled later this year.

A summary schedule showing all completed and planned CCDev2 milestones can be found at:

<http://www.nasa.gov/exploration/commercial/>

TECHNICAL INTERCHANGE MEETINGS BETWEEN NASA AND COMMERCIAL PARTNERS PRODUCE RESULTS

Technical Interchange Meetings (TIMs) are informal forums where NASA and industry partners' experts meet and discuss detailed topics in a collaborative fashion where a free exchange of ideas is encouraged. TIMs allow quick identification and resolution, at an engineer-to-engineer level, of technical questions that crop up as systems development activities progress.

TIMs provide access to the vast knowledge and experience of NASA's subject matter experts and is a valuable benefit to industry partners as they continue development of their cargo and crew transportation systems. These exchanges can help accelerate industry's efforts by avoiding "re-inventing the wheel" as designs mature. Likewise, there has been a great deal of learning on the NASA side regarding industry's new ways of doing business and implementing new practices as they produce safe, reliable, and cost-effective commercial space transportation systems.

As SpaceX and Orbital Sciences progress toward their cargo demonstration flights to the ISS this year, TIMs continue to play a critical role in rapidly identifying, understanding, and mitigating issues associated with systems development and qualification, as well as ISS visiting vehicle interface and safety verification. TIMs are also proving beneficial under CCDev2. Several TIMs a month have been held, in areas such as launch abort, ground operations, testing, docking systems, and ISS requirements for crewed operations. NASA's funded CCDev2 partners have recognized the value face-to-face interactions between experts provide, and they are taking advantage of the opportunities.

"TIMs have been extremely valuable during our CCDev2 effort and are perhaps the most productive technical interchanges between SpaceX and NASA," states SpaceX's CCDev2 Manager, Garrett Reisman.

Blue Origin has participated in a number of TIMs recently on topics such as rendezvous and docking, Space Shuttle Main Engine lessons learned, power, and life support systems. "We've found it very valuable to have direct interactions with the NASA personnel who have learned these important lessons from hands-on experience," said Blue Origin's Bretton Alexander. "It is much harder to incorporate the lessons learned from 50 years of spaceflight if you're just reading technical reports."

NASA's unfunded CCDev2 partners are also utilizing TIMs to further their efforts.

"Being able to pull from some of NASA's best talent has furthered our progress on the Liberty Transportation System," said Kent Rominger, ATK VP and program manager for Liberty. NASA's other unfunded rocket developer, United Launch Alliance (ULA), is also active in TIMs with NASA personnel. "ULA and NASA partnering in a Commercial environment is very effective," says Michael Holguin, ULA's CCDev program manager. "TIM's provide ULA the opportunity to use NASA team members as human space flight subject matter experts."

As NASA and our industry partners continue to work together to develop new cargo and future crew transportation systems, TIMs will continue to play a critical role ensuring our future in space.